

vol 1

A  
LITTLE LIBRARY  
For all that are Studious in the  
great A R T of  
Navigation:

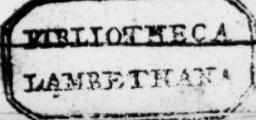
Built and furnished,  
By J O H N S K A Y , Mathematician,  
Philosopher, and Notary-  
publique.

*Mathematica Doctrina conductit ad reliquas Artes ;  
maxime enim preparat viam ad Theologiam, Phisico-  
conductit, plurimum prodest moribus : Ptol.  
Mathematics omnes Disciplinas  
completatur.*

23 Decemb. 1646. Imprimatur JOHN BOOKER.



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To the Honourable MAIOR,  
and his Worshippull Brethren,  
The ALDERMEN of London.



May now write my selfe an Old man ( right Hon : ble : and Worshipfull ) having passed LXII.yeares compleat , In all which time Experience and Judgement with understanding , one chiefe facuty of my Soule , have fully satisfied me , That this Alphabet and Primer with the rest are very necessary , not onely for Sea-men ; but also for many other well minded people in this your famous City , whose affections and will that working faculty of our Soules , is accompanied with good Conscience though with small learning . Therefore to help their good mother witt's , here are ; first , foure generall directions . The Alphabet distinguished by Vowels and Consonants to any vulgar capacity : To spell the rules of Reason and to know a substance from it's Accidents , which is a good lesson : An order of Substances , whereby to know God's workes ; And an order of the Accident's for sensible demonstrations humane and ratiōnall invention , morall and divine uses .

Then they may easily discerne the Seaven speciall store-houses for mans memory , as they issue from these ; with the cautions and directions , how to put questions modestly , and to make answier decently ; and thirdly , to read reason , by reall application and use ; in the morall vertues briefly , then in Navigation with the parts ; in six Theorems , in the liberall Art's . All which and more is needfull , as well for Seamen in Navigation by which your honourable City is made famous and greatly enriched God be praised ; as for all other , that ought to know , and desire to learne them ; for as much as it is greatly needfull , and necessary for all man-kind , to containe their copious boundlesse and busie minds , within the limits of right and sanctified reason .

A little Art helps a good Nature , and diligence mendes the depraved or dull : for whereas a very great number of people in the world , are almost mad with a cold and dry quality , the earthy humour of black , Melancholly , or as it were dranke , being intoxicate with a hot and

*The Epistle Dedicatory.*

moist quality, the Airy Sanguine humour; Or too much fumed with a cold and moist quality, The watry white Phlegmaticque humour: or all fired with a hot dry quality the yellow chollerique humor: By these few rules and lesions rightly used and well applied; the Malignity will bee taken away, and by reason the extremities in those qualities and humors shall be healed; the inordinate passions with the sensuall faculties subdued corrected governed; and the affections that stand between reason in the mind, and tentivity, will be well ordered and settled: which by understanding judgement and the other faculties of the mind are brought to be serviceable to the Soule who is Lord Paramount in Microcosmus: She will teach us to be like her selfe, rationall and spiritually minded, and by reason, to expell vice, love and imbrace divine vertue and heavenly Grace.

These things are briefly shadwed forth in the seaven Books within this little Library purposely applyed by me unto Navigation and Seafaring men; If your memories may remaine in this Epistle, you will ever deserve most worthy thankes of all that receive profit by it: the labour is mine, and not without some cost, and those that desire it must labour in it, serve God and use the meanes, if ever they will worthily apprehend it. Fare you well, and rest ever vertuous, gracious, happy; and as you are, have, and shall be each one a good Lord in your turne: so no doubt but you will all meet me, and be dust in your Grave: We that are sinners must die and after death wee shall meet together and come to judgement. Till then none can be judged happy: yet it is accounted some degree of happiness, to bee in the way of happiness, but more happy in chosing the better part, which shall not be taken from us if we persevere therein to the end. Therefore most happy of all, and blessed are the dead that die in the Lord: The reason why? For they rest from their labours. What labour I pray you doe the great men of the World? They subdue sinne that it Reigne not in their mortall bodies.

The Tree of sinne is a Sea-plant growing in Mare-Aphaltum: the root is Originall, the trurke sensuall, the sap diabolicall; and the rinde worldly vanities: it hath abundance of branches, buds, leaves, flowers, and fruits: but wee shall be delivered from this body of sinne wretched men as we are: *Et quemadmodum regnauerat peccatum ad mortem, ita etiam gratia regnaret per justitiam ad vitam eternam per Iesum Christum Dominum nostrum.*

TO

THE  
Sea-mans Alphabet,

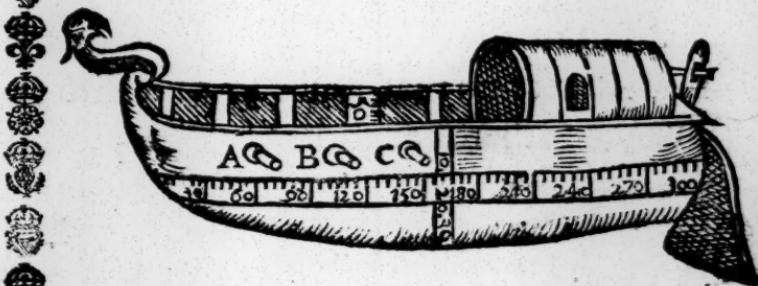
BY,  
*J. S. M<sup>r</sup>. in the Arts*

*Legendi Scribendi Calculandi ac Mathe-  
maticorum.*

*Mathematice ex vi verbi omnia MAΘHMATA id  
est Disciplinas Complectitur. Sav. pr<sup>g</sup>l. 2.*

*O Deus!*

*Posuisti in mari viam, & in flutibus securum Callem. Sap.*



Printed at London, by Richard Cotes. 1645.



*To the Reader.*

**B**eloved this Pamphlet  
was published for a helpe  
to our ycung Marinors,  
and to teach them in a  
Rationall way, their owne  
A. in part; by the helpe of eight Reason:  
if it profit them, the Author hath his de-  
sire, if not, the fault may be in the Patient,  
and not in the Agent. But if it prove  
nought, let him that licensed it, cause it to be  
burnt, and there's an end.

A 2

To



# THE Sea-mans Alphabet.

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To my joviall young Seamen, who (not knowing enough) may here learne more, if they be but willing to do themselves good.

**G**lorious Youths ! be not too witty, to bee wise indeed: be not to forward, nor foward; are ye voyd of Reason ? You know, for as much as Almighty God hath given unto man a living Soule, and hath endowed him with Reason above all other Creatures: Therefore they doe not onely fly things hurtfull, Seekeing that which is good necessary and profitable to the body, as other Creatures doe: but also they prosecute their matter unto a good degree of perfection, though they have no learning at all; by help of their Mother Witt and naturall Reason only.

Yet when there is adjoyned the knowledge and use of good Letters, So as we can but Reade and Write, surely one of our Eyes will be well opened; especially if also wee

learne to Number and Measure well: for then wee shall see more Cunningly how to handle and Mannage our affaires both by Sense and Reason, as common experience proveth.

But unto these you must add also, the knowledge and uses of this your ensuing Alphabet (of Words) for thereby certainly both your Eyes will be opened, both of Reason and understanding: to see clearely, and obtaine the knowledge of all matters, and of all things.

*The Alphabet.*

**G**enus, Species, Difference, Propertie, Accidens: Substance, Quantity, Quality, Relation, Action, Passion, *Ubi, Quando, Situs, Habiens.*

*To know this Alphabet.*

The first 5. are certaine degrees of words, and are as the vowels among the Letters, being the most common in their uses. The other 10. words are most generall, as the Consonants.

And as diligently as children and young Schollers learn their letters and parts of speech, so ought all young Mariners and Seamen (that hope here after to bee good Commanders, and to serve their Country truely) to learne all these 15. words by heart, if they meane to bee guided by Reason.

*To spell Reason.*

Take the first Consonant, Substance, and set it before the foure first vowels thus. Substance with it's Genus, Species, Difference, Property. Take also the last Vowel, Accedens, and put it before the other nine Consonants, thus. Accidens in Quantity, Quality, Relation, Action, Passion,

### *Alphabet.*

Passion, *Ubi*, *Quando*, *Situs*, *Habitus*; and so we may learne to know, a Substance, from the Accedents.

For the former 5, in this Order are Substances, or in the Substance, as every Substance hath it's Genus that is the generall kind; and is the species, or speciaall kind, which hath evermore a difference and property.

But the Accidents are things chanceing and cleaving to Substances, they cannot be without a Substance where unto they sticke, but yet they are not substances.

### *An order of Substances.*

Substances are either without a body, as God and his heavenly Angels, Spirits, and the soules of men, also lines, and superficies; vertues, vices, and affections of the mind.

With bodies, simple and pure, as the visible heavens, with the fixed Starrs & Planets, also the four Elements: or

Unperfectly mixt as the Meteors dry and moyst: or perfectly mixt without life as Stones, Minerals and Mettles, with Liquors.

Vegetables, as Rootes, grasse, plants, and Trees: and animales, having fence and motion, as, Wormes, Beasts, Fish, Foule, and all living creatures being voyd of Reason.

Also the rational creatures, as the whole race of Mankind.

### *Order of Accidents.*

It is by Accident that any thing is in Quantity great or little; by Quality good or bad; by Relation wee learne to who, or what, anything belongeth; Action is the doing; Passion is the suffering; *Ubi* where; *Quando* when; *Situs* the manner; and *Habitus* the forme.

God only is not subject to Accidents, but all creatures are subject unto the Accidents. And these<sup>4</sup> are the first Store-houles for mans memory, wherein hee may at all times find meanes to define any thing, and to devide it into the most convenient parts, and out of these places other are invented, found and produced, thus.

*Storehouses of invention.*

1. In the Substance, the Definition, the generall Word, the Kinde, the Property, the Whole, the Parts, the Yoked word.
2. Incident to Substances are the words adjoyned; the manner of doing: the thing contained.
3. Of Affinity are the Causes; efficient, Materiall, Formall, Finall; the End.
4. The Events; as the Effect; the thing appoited for some end.
5. Application, unto Time, Place, things Annexed.
6. Accident: as things Chancing, Sentences of the Wise; the Name; things Compared; things Like.
7. Repugnats are things Differing, Discordants, Contraries.

Men differed little from beasts, if they could doe no more but Distinguish Words and knew not how to apply them to good uses, nor is every speech to be allowed; but onely such Sentances, as doe shew with apt brevity: the Manners and Common practises of Men; what ought to be and what ought not. Therefore these seven are the second Store-houses for Mans Memory wherein we may at pleasure invent good matters plentifull, and with greate ease.

Not that you shall neede at every turne, all these: but take

take what you find most necessary; as well in the former fifteen, as in these seven heads of places; leaveing the rest after examination which are fitteſt for you godly purpose.

For there are very many things that ought not to be Reasoned of: As of late ſome hattie done, both againſt God and his Word, and Sacraments, and againſt Religion, and government.

But every matter that is Lawfull, Godly, pleasant, profit-able, and honest, may right well be Reaſoned of; and that by putting it to the question, thus. First, whether it be or no? Secondly, What it is? Thirdly, What are the parts? Fourthly, the Causes? Fifthly, the Effects? Sixthly, What is next adjoyned? Seventhly, What Examples? and eightly, What Contraries.

All theſe things hitherto you may privatly leарne and diligenter practife applying two or three as in theſe following Examples: *a little old holtre a good nature.*

### *To reade Reason.*

*what is Virtue? It is right reason. Therfore also*

Answer, from the seventh Store-houſe of Invention which hath the places of Repugnancys; and fay

Virtue is the Contrary to vice, So the vices of Malice and hatred are Contrary to the Diuine Virtue of Love and Charity: but the hatred of evill is a ſingular virtue.

### *What parts hath Virtue?*

All Morall vertue is Comprehended under theſe four heads; Prudence, Justice, Fortitude, and Temperance.

### *To what effect are theſe?*

Every malignant Vice is preſently casheerd, and cleane put

put away, by bringing in it's repugnant, that is; by the present practise of the contrary Vertue.

*For what end?*

Prudence hath respect to all our worldly affaires; Justice hath care of all persons: Fortitude and Temperance have regard unto all Accidents that happen in the whole course of our lives: Therefore they are singular Rules, to guide our Lives.

*Is there such a thing as men call Navigation?*

Answer from Genus, that the abundance of Shipping, and the great Traffique by Sea doe manifest it.

*What is Navigation?*

Answer first from the materiall cause, and from Quallity, and say; Navigation is an Art and Science, composed of many Arts and Sciences: teaching by infallible Rules, how to governe and direct: (then from species, Difference, place and Time, say) a Shipp, from one port to a nother; safely, rightly, and in the shortest time.

*What are the parts?*

Answer from the whole, and say: Navigation which teacheth us to sayle by Rumbe, and distance; by longitude and Latituds, is Divided into two principall parts; First, the Theorique. Secondly the Praictque, the Theorique is subdivided into three parts, First, Arithmetick; Secondly, Geometry, and Thirdly, Astrologie. *Vetus nomen est Astrologie qua intelligebant olim Doctrinam, non solum de viribus seu effectibus, verum etiam de motibus Siderum ac corporum Cœlestium.*

I suppose you are well versed in the two former parts

## Alphabet.

parts of the Theorick; therefore in the third part now called Astro-nomy note these Rules.

First find the Sun's place in the Ephemerides and the Zodiacke obliquity, which is equal to the greatest Declination; and in this age is about 23 deg. 30 min. and being so prepared proceed thus.

### 1 To find the Sunnes Declination, the Rule.

As the reason and proportion of the Radius is to the sine of 23 d. 30 min.; so is the sine of the Sun's distance from the next Equinoctiall point, to the sine of the Declination required.

### 2 To find his right Ascension, the Rule.

As the reason of the Radius is to the Coseine of 23 deg. 30 min. So is the Tangent of the Sun's distance from the next Equinoctiall point, to the Tangent of the rect-ascention required.

Then find the Longitude and Latitude of any fixed Starre in the Ephemerides, and againe proceed.

### 3 To find a Starres right Ascension, the Rule.

As the reason of the Radius, is to the sine of the Starres distance from the next Equinoctiall point; so is the Cotangent of his Latit. unto the Tangent of the 4. th Arch, and as the sine of that 4. th, is to the sine of the Sun or Difference of the same 4. arke, and 23 d. 30 m. so is the Tangent of his Distance from the next Equinoctiall point, to the tangent of the rect-ascention required.

### 4 To find his Declination, the Rule.

As the reason of the Coseine of that 4. th Arke, is to the coseine of the former 5. th arch, so is the sine of the Starres latitude, to the sine of his Declination required.

When to take the Sun or Differencē making the 5. th Arke, this is the Rule. If the Longitude and Latitude be both one way, as N. or South, then take the difference; but if the Longit. be one way, and the Latitide another way, then take the Summe.

As in this Globe let  $b\ ac$ , be the Equator, and  $d\ e$ , his Poles: also  $f\ g$ , the Elliptique;  $p\ q$ , the Poles; and let  $a\ h$ , be the North,  $c\ i$  the South poles; there is  $al$  or  $an$ , the Longitude; and  $k\ l$  or  $m\ n$ , the latitide of a Starre. Therefore we say if the longitude  $al$ , and latitide  $k\ l$ , be both one way, viz. North subtract; but if the longit. be  $an$ ; South; and the latit.  $m\ n$ , N. then adde according as is required.

## The Sea-mans

red in the latter part, Proposition 3 ; now  $\alpha p$ , or  $aq$ , is the right ascention, and  $p k$  or  $q m$  the Declination required.

And to prove the truth of the third and fourth Propositions, with like reason, by the rect-ascention and Declination given, we may find the Longitude and Latitude : and this is right necessary; for wile and shiffull men doe affirme and say that when all these are knowne, viz. the Longitude, Latitude, Rect-ascention, and Declination of a Starre, then the Starre it selfe is said to be knowne, and not otherwise.

These are the most certaine wayes by which the Starres are knowne, and to these adde thus much: First note their Magnitudes, then their Colours brightnesse, formes, their twinkling, their places in the Horizon, Meridian, or passing by the Zenith.

Now let us suppose you are well versed in all the three parts of the Theorique, viz. in Arithmetique, Geometry, and Astronomey, all which are to be learned at home and at Schoole : and let us consider what we have to doe at Sea, and how it is well done, after this manner of a learned way though we have little.

Then we propose the Commanders duties, as to find the Distance, and why? with the Reason. To find the Rumble, and why? with the Reason. To find the Variation of the Compasse, and why? with the Reason. To find the houre of the Day or Night, with the Reason and uses. To find the houre and minute of Conjunction of any two Planets, with the reason and utes. And to find the difference of Longitude by Cœlestiall observation onely.

Then followeth Tables of the Longitude, Latitude, Rect ascention and Declination, of all the fixed Starres of the first and second Magnitude that are yet knowne ; Calculated to the first day of January 1640 and Annuall Motion.

The Yonkers duty, is to know the Boates with their furniture ; also the Ships Hull, Masts, Yards, Ruggings, and Sayles.

There is yet a 4. part belonging aswell to the Theorique, as to the Practique part of Navigation & that is ; the Statique Art, the Art of waying well, wherein we consider not onely the Common waights, Tunnage and such like, but also the Sublunary World it selfe, in the knowledge whereof is not the least part of the Mariners care and skill

## Alphabet.

Skill to be employed, for the safety both of themselves and Ships,  
with all that is in them.

Therefore, unto the three former parts, and unto his experience, the Sea-man ought to adjoyn this knowledge, the Doctrine whereof is so Divine, having the hand of God alwayes in it; so that our dayly Experience teacheth us, that all things within this Sub-lunary World are in perpetuall Agitation, ever subject to alteration, Corruption and desolution; but this belongeth to the Phisiques, for Meteorologie is a part of Naturall Philosophie.

Lastly, I deliver you here 6 good Lessons, which being throughly understood, may make you (by the grace of God) a good Marriner. They may seeme Paradoxes unto some, but you shall hereafter find by their infallible Demonstrations, the undoubted truth of them; therefore I propose them as Theoremes.

### Theoreme. 1.

Grammer is not the first Art *In rerum Natura*, but it riseth  
out of another Art, and into the same it selfe desolveth.

### Theo : 2

The Mathematical Arts and Sciences are profitable and necessary unto Naturall, Morall, Metaphysicall, and Divine knowledge.

### Theo : 3

The Magnitude and distances of the Coelestiall bodies (to the Earth) may be measured and found, by them that will learne the reason.

### Theo : 4

The Sunne will come twice to one and the same poynt of the Compasse, in one and the same day, yea in an houre, to some Men; namely to those that are wise enongh to understand the Reason.

### Theo : 5

The difference of Longitude may be found by Coelestiall observa-  
tion, every where; by all them that will learne the Reason.